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09559627 BA

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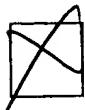
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*Has received an application for a patent for a new and useful invention. The title and description of the invention are enclosed. The requirements of law have been complied with, and it has been determined that a patent on the invention shall be granted under the law.*

*Therefore, this*

## United States Patent

*Grants to the person(s) having title to this patent the right to exclude others from making, using, offering for sale, or selling the invention throughout the United States of America or importing the invention into the United States of America for the term set forth below, subject to the payment of maintenance fees as provided by law.*

*If this application was filed prior to June 8, 1995, the term of this patent is the longer of seventeen years from the date of grant of this patent or twenty years from the earliest effective U.S. filing date of the application, subject to any statutory extension.*

*If this application was filed on or after June 8, 1995, the term of this patent is twenty years from the U.S. filing date, subject to any statutory extension. If the application contains a specific reference to an earlier filed application or applications under 35 U.S.C. 120, 121 or 365(c), the term of the patent is twenty years from the date on which the earliest application was filed, subject to any statutory extension.*

A handwritten signature in black ink that reads "Bruce Lehman".

*Commissioner of Patents and Trademarks*

A handwritten signature in black ink that reads "Marjorie V. Turner".  
Attest



US005745182A

# United States Patent [19]

Yukitake et al.

[11] Patent Number: 5,745,182  
 [45] Date of Patent: Apr. 28, 1998

[54] METHOD FOR DETERMINING MOTION COMPENSATION

0395440A2 10/1990 European Pat. Off.  
 0447068A2 9/1991 European Pat. Off.  
 0484140A2 5/1992 European Pat. Off.

[75] Inventors: Takeshi Yukitake; Shuji Inoue, both of Yokohama, Japan

## OTHER PUBLICATIONS

[73] Assignee: Matsushita Electric Industrial Co., Ltd., Osaka, Japan

A. Puri, et al, "Video Coding with Motion-Compensated Interpolation for CD-ROM Applications", Signal Processing, Image Communication, vol. 2, No. 2, pp. 127-144, Aug. 1990.

[21] Appl. No.: 278,010

K. Kinuhata, et al, "Universal Digital TV Codec —Unicodec", 7th International Conference on Digital Satellite Communications, May 1986, pp. 281-288.

[22] Filed: Jul. 20, 1994

(List continued on next page.)

## Related U.S. Application Data

[62] Division of Ser. No. 970,046, Nov. 2, 1992, Pat. No. 5,369,449.

## [30] Foreign Application Priority Data

Nov. 8, 1991 [JP] Japan ..... 3-293004  
 Jul. 9, 1992 [JP] Japan ..... 4-181980

[51] Int. Cl. 6 ..... H04N 7/32

[52] U.S. Cl. ..... 348/416; 348/699

[58] Field of Search ..... 348/413, 416,  
 348/699, 400-402, 407, 409-412, 384,  
 390, 415; 382/232, 236, 238; H04N 7/137

## [56] References Cited

## U.S. PATENT DOCUMENTS

4,691,230 9/1987 Kaneko et al. ..... 348/699  
 4,862,266 8/1989 Gillard ..... 348/699  
 4,864,294 9/1989 Gillard .....  
 4,989,089 1/1991 Chantelou et al. ....

(List continued on next page.)

## FOREIGN PATENT DOCUMENTS

0395271A2 10/1990 European Pat. Off. ....

## [57] ABSTRACT

A method for predicting motion compensation for determining of an input image based on a motion vector of the input image from this input image to a reference image which has been sampled at a first set time, and the method includes calculating a motion vector of the input image based on a move, at a second set time, of a block unit which is a part of the input image and consists of a plurality of pixels, and calculating a motion vector of the reference image based on a move, at the first set time, of a block unit which is a part of the reference image and consists of a plurality of pixels. Move compensation of the input image is calculated both from the motion vector of the input image and from the motion vector of the reference image, to thereby realize a method for determining motion compensation with high precision.

3 Claims, 6 Drawing Sheets

